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Ueber die Entwicklung der Furchen und Windungen des menschlichen Gehirns. J. MINGAZZINI. Moleschott's Untersuchungen, XIII, 6, S. 498. Reviewed in Centralblatt f. Physiol. No. 5, 1888, by Ziehen.

The chief point of this investigation was to determine at what stage of development the variations in the convolutions became apparent, whether they appeared simultaneously on both sides, and other related facts. 42 foetal brains hardened in alcohol and zinc chloride were the material used in the study. M. finds that almost all the variations occur between the seventh and tenth months of foetal life—quite what is to be expected when it is recollected that the main fissures and sulci alone are marked out in the seventh month. Certain sulci are not simultaneously developed on both hemispheres. For example, the fiss. occipit. II appears more often first on the left side; on the other hand the sulci orbitales and supraorbitales first on the right side. The frontal sulci appear with perfect regularity first on the right side. The growth in the length of the sulci is unequal on the two sides, and of the secondary sulci some appear between the seventh and eighth months, others between the seventh and ninth months, while the tertiary sulci appear between the seventh and tenth months.

Differences between male and female show in the development of the gyri from the eighth month on. These consist in the male not only in an absolutely greater cerebral surface, but also in a relatively greater growth of the parts lying in front of the central fissure as compared with those lying behind it.

Ueber die Lymphwege des Gehirns. M. J. ROSSBACH und E. SEHRWALD. (Centralbl. f. d. med. Wissenschaften, 1888, Nos. 25 und 26.) Abstracted in Centralbl. f. Physiol. 1888, No. 12, by Obersteiner.

It has been suggested here and there of late that the stain produced by Golgi's method for bringing out the ganglion cells depended on a deposit of silver or mercury salts in lymph-spaces. The work of these authors goes far to support such a view, and they interpret their results as showing them three sets of lymph-spaces in the brain, those about the vessels, about the nerve cells, and about the glia cells. The relations of these spaces to the perivascular spaces and to one another are such as have been described for the prolongations of the respective sorts of cells.

It should be added in support of the view here taken, that by this same reaction the authors have been able to demonstrate lymph-spaces in many other organs, as the intestine skin, liver, muscle, cartilage, etc.

Etwas über Schädel-Asymmetrie und Stirnnaht. M. O. FRÄNKEL. Nerolog. Centralbl. No. 15, 1888.

It is certainly still open to discussion how far the development of the brain is associated with that of the skull, and whether it is safe to infer from a deformation of the skull a corresponding variation in the brain. By the younger Italian school, asymmetry of the skull is considered as a degenerative change, and their statistics go to show that it is a marked characteristic of the criminal class. Other authors look upon a moderate amount of asymmetry of the skull as

quite normal. As concerns the brain, Broca has remarked that the asymmetry of the convolutions is the special advantage of man and the more highly developed animals, while the convolutions in the primates, negro, and idiots, tend to become more and more symmetrical. Such ideas as these are of course quite out of harmony with those of the Italian school. For the purpose of seeing whether the skulls of the lower animals corresponded with their more symmetrical brain development, the author studied the relations of the frontal suture on many existing and some extinct species, and found all plainly asymmetrical, and some so to a very considerable degree. It appears from this study that brain and skull are not so interdependent, and further, that there may be some reason for considering asymmetry as the rule in the development of animal structures, and that when the Italian school point to the asymmetry of the skull as a characteristic of the criminal class, the abnormality really lies in the excessive development of the difference between the two sides rather than in a departure from perfectly symmetrical growth.

Kraniometrie und Kephalometrie. Vorlesungen gehalten an der Wiener Allgemeinen Poliklinik von M. BENEDIKT. Mit 36 Holzschnitten, viii und 172 S. Wien und Leipzig, Urban und Schwarzenberg, 1888. Reviewed in *Neurolog. Centralblatt*, No. 10, 1888, by Sommer.

The author has first to call attention to the relations between the atypical development of the skull and abnormal brain functioning, while the final goal of craniology is from the study of the form of the skull to infer all the laws of its growth. In his own studies he has used an elaborate instrument called an optical kathetometer. From his investigations, he is led to the view that the exterior of all skulls presents a definite number of spherical surfaces, often with very various radii; that these stand in relation to definite portions of the brain, and that between these two there is a fixed relation of growth. To determine the centres for the spheres which these surfaces represent, and to compare the changes that these centres experience with the growth of the individual, etc., are, according to Benedikt, lines of research which would be very profitable, but which he has not followed. Among the special points which he has made out are that in cases of congenital (or early acquired) blindness, there is a noticeable shortening of the interparietal arch; in congenital aphasia, stenokratophy, in deafness, a shortening of the temporal arch; in epilepsy, a deformation of the parietal bones, and in criminal and psychopathic individuals a flattening of the frontal bone. Finally, he discusses the methods for determining the capacity of macerated skulls, and finds no method which is thoroughly satisfactory.

Ueber die Erregbarkeit einzelner Faserbündel im Rückenmark neugeborener Thiere. W. BECHTEREW, in *Kasan. Neurolog. Centralbl.* No. 6, 1888.

In attempting to test the function of different bundles of fibres in the spinal cord, the author has hit on the happy idea of using newborn animals. As is well known, only a portion of the bundles of fibres in the cord are medullated at birth. Bechterew assures him-